Finally, the results which flow from these figures can be seen at a glance in fig. 5, herewith. Remembering that the monthly means relate to the middle of the month, we see that throughout the whole Isthmus the rainy season begins immediately after May 1, but that soon the rains decrease on account of the northward advance of the layer of rising air. This diminution takes place in July in the interior of the Isthmus, but is subject to a delay of one month on the Pacific side and of two months on the Atlantic side. A second maximum in the rainfall occurs at the end of September in the interior, but at the end of October on the Pacific coast and in the middle of November on the Atlantic coast. Then comes the dry season, which, everywhere on the Isthmus, begins about the 1st of January and continues for four months, on account of the southward return movement of the ascending layer.

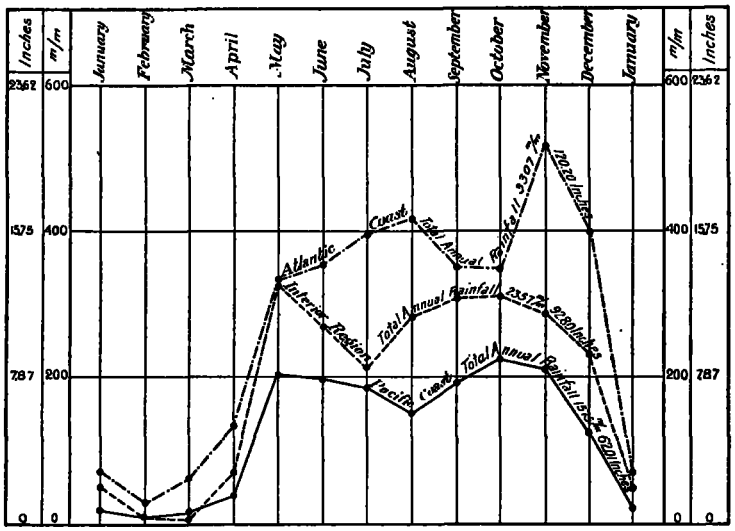

FIG. 5.—Total monthly precipitation on the Isthmus of Panama. These curves are based on the following data: For the Atlantic coast one station, Colon, for 15 years. For the Pacific coast three stations, La Boca, 1 year; Naos, 8 years; Panama, 4 years; total, 13 years. The interior of the Isthmus four stations, Gorgona, 2 years; Gamboa, 15 years; Bas Obispo, 10 years; Culebra, 5 years; total, 32 years.

These two periods of heaviest rains do not differ much from each other as to the maximum volume of water, except on the Atlantic coast, where the second period has a greater quantity of rainfall; but it must be particularly noted that the total quantity of precipitation is far from being the same everywhere. The figures are given in the following table.

TABLE 21.—*Annual precipitation, in inches.*

Section and station.	Length of record, years.	Maximum.	Minimum.	Mean.	General mean.
Atlantic coast:					
Colon	15	154.89	116.36	130.20	130.20
Interior region:					
Gorgona	2			99.77	
Gamboa	15	136.58	71.65	96.54	92.80
Bas Obispo	10	123.08	76.69	89.29	
Culebra	5	98.98	64.25	85.67	
Pacific coast:					
Panama	4	84.73	45.59	66.77	
La Boca	1			73.70	62.01
Naos	8	66.06	64.49	45.98	

These facts show that all the most difficult works of the Panama Canal, except, perhaps, the locks and the dam of Bohio, are situated in the interior or near the Pacific, where the rains are not very violent. Although the quantity of rainfall is large it is quite comparable with what is to be found in the United States near the Gulf of Mexico. Thus, the observations for many years give the following comparisons:

Station.	Number of years.	Mean precipitation.	Annual maximum.
		Inches.	*Inches.*
New Orleans, La	28	51.18	67.32
Mount Vernon Arsenal, Ala	15	66.14	106.69
Baton Rouge, La	15	59.45	116.54
Isthmus of Panama:			
Interior	32	92.91	136.61
Pacific coast	13	61.81	84.65

APPENDIX.

By A. J. HENRY, Chief of Division, Weather Bureau.

The following contains additional tables of rainfall for the Isthmus of Panama, compiled from manuscript and other records now in the archives of the Weather Bureau.

The observations at Colon, 1862 to 1874, were made by Drs. W. T. White and J. P. Kluge, surgeons of the Panama Railway Company. Those for 1893–95 were kept by O. B. Schaffer, C. E., Panama Railway.

The record for Taboga Island, 1861–66, is drawn from a report on interoceanic ship canals, page 29, published as Senate Ex. Doc. No. 75, Forty-fifth Congress, 3d Session.

It is proper to state that the officials of the Panama Railway Company have been asked to furnish a complete record of rainfall made by the officers of the Company at Panama, from the beginning of observations in 1862 to the present time.

TABLE 22.—*Precipitation at Colon.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1862	.....	.....	.....	.....	.....	.....	.....	.....	.....	18.10	43.01	16.83	.....
1863	1.75	2.94	0.85	.....	13.09	15.32	25.76	10.34	15.54	11.22	17.59	15.21	.....
1864	1.90	0.77	0.78	0.44	15.87	8.78	.....	13.37	17.85	12.83	17.90	16.40	.....
1865	[1.10]	1.08	0.02	3.89	9.22	16.85	9.61	18.39	8.55	9.69	22.16	6.58	107.4
1866	3.99	1.07	0.21	4.07	14.76	12.17	16.72	12.72	18.82	15.04	21.72	8.42	129.7
1867	1.56	0.80	0.48	1.20	11.88	8.85	16.08	19.82	5.35	20.50	.....	.....	.....
1868	†1.17	2.77	2.18	0.87	7.24	18.11	20.60	12.50	16.16	13.13	21.58	3.72	120.0
1869	0.83	0.77	0.49	5.04	6.72	10.66	18.22	14.02	8.98	14.82	24.13	10.10	114.8
1870	4.30	3.33	4.95	6.46	20.95	12.48	15.60	16.35	6.74	11.21	32.42	14.85	149.6
1871	15.42	0.53	0.05	1.52	1.63	7.70	23.27	11.56	8.00	12.58	12.38	4.94	99.6
1872	3.57	0.75	0.83	1.30	21.42	22.00	19.90	19.97	16.20	30.32	19.11	13.19	168.5
1873	6.33	0.25	0.13	2.18	3.92	13.20	12.50	10.69	10.91	14.30	11.77	0.94	87.1
1874	5.33	1.34	3.94	18.02	8.92	15.87	13.62	17.28	8.22	16.65	20.62	7.89	137.7
1893*	1.73	3.86	1.81	8.05	6.65	12.34	11.44	15.10	9.92	12.28	17.78	30.94	131.90
1894	5.35	1.69	0.36	2.18	9.84	12.24	19.08	28.02	18.79	12.43	23.66	25.12	158.76
1895	3.85	1.82	2.08	22.36	16.17	9.25	17.10	14.15	12.11	16.47	.....	.....	.....

*O. B. Schaffer, C. E., Panama Railway. See M. W. R., 1898, page 362.
†One day missing.

[Mr. C. F. Talman, Weather Bureau Observer at Colon, reports that the rainfall for Colon in 1895, as published in the MONTHLY WEATHER REVIEW, 1898, p. 352, and 1899, p. 203, differs in some cases from the records in the office of the Panama Railroad Company at Colon, which, he states, reads as follows: 1895, April, 21.96 (not 22.36); May, 18.14 (not 16.17); September, 12.10 (not 12.11). No explanation of these differences is known.—ED.]

TABLE 23.—*Precipitation at Taboga Island.*

N. 8° 48′, W. 79° 32′; altitude 10 feet.

1861	0.00	0.00	0.00	2.16	14.30	10.91	8.27	4.30	8.87	11.19	5.23	6.76	71.99
1862	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1863	0.00	0.00	0.00	0.26	1.60	8.80	8.11	9.54	11.94	1.62	2.87	3.77	48.51
1864	0.50	0.00	0.00	0.00	3.13	4.78	2.08	5.91	3.60	11.33	2.97	11.42	45.72
1865	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1866	.....	.....	.....	.....	.....	.....	.....	8.74	4.90	5.16	5.12	4.30	.....

SPURIOUS TORNADO PHOTOGRAPHS.

By Mr. ALFRED J. HENRY, Chief of Division.

We have watched with interest and curiosity the efforts of some manipulators of the camera to reproduce the phenomena of nature in all her varying moods. There can be no particular fault found with the enterprise of the photographer, be he amateur or professional, who sallies forth at high noon, or soon thereafter, and under the friendly shadow of an accommodating cloud makes *moonlight* views by the score. We confess, too, that we can pass into the waste